



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 ROSS AVENUE, SUITE 1200

DALLAS, TEXAS 75202

July 28, 1989

MEMORANDUM

SUBJECT: Proposed Aquifer Exemption

FROM: *Richard C. Peckham*
Richard C. Peckham
Geologist (6W-SE)

TO: Gus Chavarria
Chief
UIC Permits and Enforcement Section (6W-SE)

Phillips Petroleum Company has requested that a part of the Happy Hollow and Z-Sand aquifers in western Osage County, Oklahoma be designated as exempted aquifers. The USDW's meet all the necessary conditions (see attached "Fact Sheet") to be exempted, and I recommend the exemptions be granted.

The following, or similar, notice of intent to exempt the aquifers should be published:

The Environmental Protection Agency proposes to designate a portion of the Happy Hollow and Z-Sand aquifers in western Osage County, Oklahoma as exempted aquifers, in accordance with 40 CFR Part 147.2908. The parts of the aquifers being exempted are located at a depth below land surface between 500 and 800 feet. The exempted part of the aquifers are limited to the following legal locations:

Township 25N, Range 6E

Section Quarter Section

2	NW, SW
3	All
4	All
5	NE, SW, SE
6	SE
7	All
8	All
9	All
10	All
15	NW
17	All

Township 26N, Range 6E

<u>Section</u>	<u>Quarter Section</u>
1	All
9	NE, NW, SE
11	All
12	All
13	All
14	All
15	NE, SE
22	All
23	All
26	SW
27	All
33	NE, SE
34	All
35	NW, SW

Township 27N, Range 6E

<u>Section</u>	<u>Quarter Section</u>
36	All

The aquifers being exempted:

- (a) Do not currently serve as a source of drinking water; and
- (b) They cannot now and will not in the future serve as a source of drinking water because:
 1. They are situated at a depth or location which makes recovery of water for drinking purposes economically or technologically impractical; and
 2. The Total Dissolved Solids content of the ground water is more than 3,000 and less than 10,000 mg/l and they are not reasonably expected to supply a public water supply.

The aquifer exemptions are being limited to injection of water of a quality equal to or better than that contained in the exempted aquifers.

FACT SHEET

Happy Hollow and Z-Sand Aquifers Exemption in Western Osage County, Oklahoma

Phillips Petroleum Company requested that a part of the Happy Hollow and Z-Sand aquifers be designated as exempted aquifers because they meet the following criteria, as required by 40 CFR Part 147.2908:

- A. They do not currently serve as a source of drinking water.
- B. They cannot now and will not in the future serve as a source of drinking water because:
 - 1. They are situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical; and
 - 2. The Total Dissolved Solids content of the ground water is more than 3,000 and less than 10,000 mg/l and they are not reasonably expected to supply a public water system.

The part of the aquifers requested to be exempted cover approximately 21 square miles and are located in Osage County, Oklahoma in the following locations:

Township 25N, Range 6E

<u>Section</u>	<u>Quarter Section</u>
2	NW, SW
3	All
4	All
5	NE, SW, SE
6	SE
7	All
8	All
9	All
10	All
15	NW
17	All

Township 26N, Range 6E

<u>Section</u>	<u>Quarter Section</u>
1	All
9	NE, NW, SE
11	All
12	All
13	All
14	All
15	NE, SE
22	All
23	All

Township 26N, Range 6E (con't)

<u>Section</u>	<u>Quarter Section</u>
24	All
26	SW
27	All
33	NE, SE
34	All
35	NW, SW

Township 27N, Range 6E

<u>Section</u>	<u>Quarter Section</u>
36	All

The Z-Sand is a locally named sandstone of the Buck Creek Formation of the Pennsylvania series. It ranges in thickness between 40 and 60 feet. The Happy Hollow is a limestone also in the Buck Creek Formation. It is located approximately 100 feet above the Z-Sand and ranges in thickness between 10 and 30 feet. In the area petitioned, the two units occur at depths between 500 and 800 feet below the land surface. The confining layer between the shallow USDW's and the top of the Happy Hollow and/or Z-Sand ranges between 350 feet and 500 feet and contains 125 to 150 feet of cumulative shale.

Through the evaluation of the spontaneous potential curve on electric logs and some actual water analyses, Phillips has satisfactorily demonstrated, within the area petitioned, that the two units contain ground water with total dissolved solids of more than 3,000 mg/l and it is not reasonable to expect them to supply a public water system because of the good quality water available through a rural water system. Phillips also submitted considerable data comparing the costs of obtaining a water supply from the Happy Hollow or Z-Sand with that of the rural water system to substantiate that the aquifers are situated at a depth which makes recovery of water for drinking water purposes economically or technologically impractical.

Section 24 of Township 26N and Range 6E should be excluded from the exempted area because the Vamoosa aquifer is the lowermost USDW in this section. The base of the Vamoosa aquifer is approximately 200 feet below the Z-Sand and the Vamoosa is the most extensive aquifer in Osage County.

Phillips does not intend to inject into the exempted aquifers. The exemption is being sought to allow the operator to maintain fluid levels below the base of the lowermost USDW.